INSTITUT NATIONAL
DES SCIENCES
APPLIQUÉES
LYON

Operating Systems and Networking
Network basics

IDENTIFICATION

CODE :	IF-3-S2-EC-RE
ECTS :	2.0

HOURS

Lectures :	10.5 h
Seminars :	8.0 h
Laboratory :	8.0 h
Project :	0.0 h
Teacher-student contact :	26.5 h
Personal work :	25.0 h
Total :	51.5 h

ASSESSMENT METHOD

Personal works associated to each TD and lab and a final exam (documents are allowed)

TEACHING AIDS

Paper copy of the slides of the course. Basic exercvises and Lab description. Videos and on line exercises associated to key points / practical works will be available on the Moodle Platform (in french).

TEACHING LANGUAGE

French

CONTACT

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AIMS

This course aims at providing the necessary knowledge and competencies to design and manage a distributed infrastructure, supporting corporates information system (including industrial and SCADA computing resources). These technical knowledge and competencies include:
[1] understanding protocl engineering models and methods
[2] providing the necessary knowledge on telecommunication infrastructure (from signal processing techniques and constraints to the introduction routing principles)
[3] understanding and being able to implement a method to design and configure a distributed infrastructure
TDs and labs provide realistic use-cases to support a learning by example strategy.

CONTENT

Part 1: Protocol engineering
1.1: Models used to implement communication stacks including finite state automata based descriptions, activity encapsulation and data structure (i.e. PDU, SDU and PCI) organisation
1.2: Specification methods including automata meta-model, SDL descriptions, organisation of a testing strategy
1.3: Algorithmic patterns including variables, windows and time management
Part 2: Telecommunication systems and infrastructure
2.1: Information transmission and signal processing including signal processing basics, modulation techniques and how to provide a functional design of a modem and of an interface protocol
2.2: LAN organisation and Medium Access Control methods
2.3: Routing principles and introduction to IP
Part 3: Method to design and configure a distributed infrastructure
3.1: Requirements and traffic analysis
3.2: Wired infrastructure organisation and interconnection principles
3.3: Configuration management ¿ Introduction to DHCP and DNS protocols

TD and labs use a realistic use case (namely a network infrastructure desig,ed for a SME) to support practical works. Simulators and virtual machines are used to allow practicing network design and configuration as well as introducing network management basic toolset.

BIBLIOGRAPHY

[1] G. Pujolles. Les Réseaux
[2] A. Tannenbaum. Réseaux : architecture, protocoles, applications.
[3] G. Beuchot. Téléinformatique : Tome 1. Polycopié INSA.
[4] L. Toutain. Réseaux locaux et Internet

PRE-REQUISITE

3IF-RE1 - Network programming skills.